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REMARKS

This is intended as a full and complete response to the Office Action dated June 9, 2003, having a shortened statutory period for response set to expire on September 9, 2003.

Claims 1 - 40 were considered by the Examiner and rejected. Claims 2-3, 15, 25, and 35-40, have been cancelled without prejudice by Applicant. Applicants believe that no new matter has been introduced in this response.

Claims 1-19 are rejected under 35 U.S.C. § 112, first paragraph. Claims 1-19 have been amended where appropriate to clarify the claimed subject-matter. Withdrawal of the rejection is respectfully requested.

Claims 1-2, 5-7, 10-12, 15-18 and 29-30 are rejected under 35 U.S.C. § 112, first paragraph. Applicants traverse this rejection on grounds that the disclosure of the invention discloses in paragraph [0008] plating metal on a substrate from a plating solution having metal ions. Withdrawal of the rejection is respectfully requested.

Claims 1-28 and 37 are rejected under 35 U.S.C. § 112, second paragraph. Claims 1-28 and 37 have been amended where appropriate to clarify the claimed subject-matter. Withdrawal of the rejection is respectfully requested.

Claim 1, 2-4, 7 and 10 are rejected under 35 U.S.C. § 102(b) as being anticipated by, or under 35 U.S.C. § 103(a) as being unpatentable over, *Feldstein*, U.S. Patent No. 4,282,271. The Examiner asserts that *Feldstein* discloses the elements of the recited claim 1, or that it would have been obvious to one having ordinary skill in the art to modify the process of *Feldstein*. Applicants respectfully respond to the rejection.

Feldstein discloses an electroless coating process using antioxidants to minimize surface oxidation and improving colloidal stability. *Feldstein* does not teach, show, or suggest a method for plating metal on a substrate, comprising providing a plating solution comprising metal ions, an acid, halide ions, one or more organic additives configured to enhance one or more plating characteristics, and an at least one anti-oxidant being selected from the group consisting of sodium stannate, hydroquinone, butylated hydroxy toluene, and combinations thereof, wherein the anti-oxidant has a

concentration between about 500 ppm and about 5000 ppm, and contacting a substrate having an electrical bias with the plating solution to deposit a metal thereon, as recited in claim 1, and claims thereon. Withdrawal of the rejection is respectfully requested.

Claims 11-14 are rejected under 35 U.S.C. § 102(b) as being anticipated by, or under 35 U.S.C. § 103(a) as being unpatentable over, EP 402,896. The Examiner asserts that EP 402,896 discloses the elements of the recited claim 11, or that it would have been obvious to one having ordinary skill in the art to modify the process of EP 402,896. Applicants respectfully respond to the rejection.

EP 402,896 discloses stabilizing an organic additive by including a transition metal being capable of existing in at least two positive oxidation states. EP 402,896 does not teach, show, or suggest disposing the substrate and an anode in a plating solution, the plating solution comprising metal ions, an acid, halide ions, one or more organic additives configured to enhance one or more plating characteristics, and at least one anti-oxidant selected from the group consisting of sodium stannate, hydroquinone, butylated hydroxy toluene, and combinations thereof, having a concentration between about 500 ppm and about 5000 ppm, and electroplating the metal ions from the plating solution onto the substrate, as recited in claim 11, and claims dependent thereon. Withdrawal of the rejection is respectfully requested.

Claims 1, 3-4, 7, and 10 are rejected under 35 U.S.C. § 102(e) as being anticipated by, or under 35 U.S.C. § 103(a) as being unpatentable over, *Naoi et al.*, U.S. Patent Application Publication No. 2003/0059634. The Examiner asserts that *Naoi et al.*, discloses the elements of the recited claim 1, or that it would have been obvious to one having ordinary skill in the art to modify the process of *Naoi et al.* Applicants respectfully respond to the rejection.

Naoi et al. discloses examples of electroplating copper-tin alloys using sodium stannate in concentrations of 15 g/L, 34 g/L and 60 g/L which are greater than or equal to copper containing compounds used to deposit the alloys. *Naoi et al.* does not teach, show, or suggest a method for plating metal on a substrate, comprising providing a plating solution comprising metal ions, an acid, halide ions, one or more organic additives configured to enhance one or more plating characteristics, and an at least one anti-oxidant selected from the group consisting of sodium stannate, hydroquinone,

butylated hydroxy toluene, and combinations thereof, wherein the anti-oxidant has a concentration between about 500 ppm and about 5000 ppm, and contacting a substrate having an electrical bias with the plating solution to deposit a metal thereon, as recited in claim 1, and claims thereon. Withdrawal of the rejection is respectfully requested.

Claims 11-16 are rejected under 35 U.S.C. § 102(e) as being anticipated by, or under 35 U.S.C. § 103(a) as being unpatentable over, *Naoi, et al.*, U.S. Patent Application Publication No. 2003/0059634. The Examiner asserts that *Naoi et al.*, discloses the elements of the recited claim 11, or that it would have been obvious to one having ordinary skill in the art to modify the process of *Naoi et al.* Applicants respectfully respond to the rejection.

Naoi et al. discloses examples of electroplating copper-tin alloys using sodium stannate in concentrations of 15 g/L, 34 g/L and 60 g/L which are greater than or equal to copper containing compounds used to deposit the alloys. *Naoi et al.* does not teach, show, or suggest disposing the substrate and an anode in a plating solution, the plating solution comprising metal ions, an acid, halide ions, one or more organic additives configured to enhance one or more plating characteristics, and at least one anti-oxidant selected from the group consisting of sodium stannate, hydroquinone, butylated hydroxy toluene, and combinations thereof having a concentration between about 500 ppm and about 5000 ppm, and electroplating the metal ions from the plating solution onto the substrate, as recited in claim 11, and claims dependent thereon. Withdrawal of the rejection is respectfully requested.

Claims 20-24 and 28 are rejected under 35 U.S.C. § 102(b) as being anticipated by, or under 35 U.S.C. § 103(a) as being unpatentable over, EP 402,896. The Examiner asserts that EP 402,896 discloses the elements of the recited claim 20, or that it would have been obvious to one having ordinary skill in the art to modify the process of EP 402,896. Applicants respectfully respond to the rejection.

EP 402,896 discloses stabilizing an organic additive by including a transition metal being capable of existing in at least two positive oxidation states. EP 402,896 does not teach, show, or suggest a liquid solution containing copper ions to be plated on a substrate, an acid, halide ions, at least one organic plating additive configured to facilitate a plating characteristic of the copper ions onto the substrate, and at least one

anti-oxidant selected from the group consisting of sodium stannate, hydroquinone, butylated hydroxy toluene, and combinations thereof, wherein the anti-oxidant has a concentration between about 500 ppm and about 5000 ppm, as recited in claim 20, and claims dependent thereon. Withdrawal of the rejection is respectfully requested.

Claims 20-22, 25-26, and 28 are rejected under 35 U.S.C. § 102(e) as being anticipated by, or under 35 U.S.C. § 103(a) as being unpatentable over, *Naoi, et al.*, U.S. Patent Application Publication No. 2003/0059634. The Examiner asserts that *Naoi et al.*, discloses the elements of the recited claim 20 and claims dependent thereon, or that it would have been obvious to one having ordinary skill in the art to modify the process of *Naoi et al.* Applicants respectfully respond to the rejection.

Naoi et al. discloses examples of electroplating copper-tin alloys using sodium stannate in concentrations of 15 g/L, 34 g/L and 60 g/L which are greater than or equal to copper containing compounds used to deposit the alloys. *Naoi et al.* does not teach, show, or suggest a liquid solution containing copper ions to be plated on a substrate, an acid, halide ions, at least one organic plating additive configured to facilitate a plating characteristic of the copper ions onto the substrate, and at least one anti-oxidant selected from the group consisting of sodium stannate, hydroquinone, butylated hydroxy toluene, and combinations thereof, wherein the anti-oxidant has a concentration between about 500 ppm and about 5000 ppm, as recited in claim 20, and claims dependent thereon. Withdrawal of the rejection is respectfully requested.

Claims 29-32 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Naoi et al.*, U.S. Patent Application Publication No. 2003/0059634. The Examiner asserts that one skilled in the art would calculate the concentration or to replenish the amount of sodium stannate depleted in the plating process. Applicants respectfully respond to this rejection

Naoi et al. discloses examples of electroplating copper-tin alloys using sodium stannate in concentrations of 15 g/L, 34 g/L and 60 g/L which are greater than or equal to copper containing compounds used to deposit the alloys and does not suggest or motivate adding sodium stannate in an amount corresponding to a time varying amount of degraded organic plating additives generated in the electrochemical plating solution and is silent as to the amount of additives. Thus, *Naoi et al.* does not teach, show, or

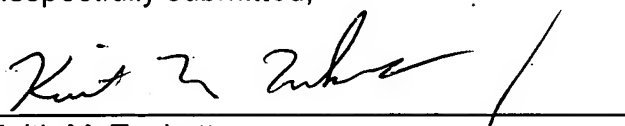
suggest a method for reducing degraded organic plating additives in an electrochemical plating solution, comprising adding sodium stannate to the electrochemical plating solution, the sodium stannate being added in an amount corresponding to a time varying amount of degraded organic plating additives generated in the electrochemical plating solution, as recited in claim 29, and claims dependent thereon.

Claims 35-36 and 40 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Naoi, et al.*, U.S. Patent Application Publication No. 2003/0059634. Claims 35-40 have been cancelled by the Applicants. Applicants respectfully request withdrawal of the rejection.

The prior art made of record is noted. However, it is believed that the secondary references are no more pertinent to the Applicants' disclosure than the primary references cited in the office action. Therefore, it is believed that a detailed discussion of the secondary references is not deemed necessary for a full and complete response to this office action. Accordingly, allowance of the claims is respectfully requested.

In conclusion, the references cited by the Examiner, neither alone nor in combination, teach, show, or suggest the methods and compositions of the present invention. Having addressed all issues set out in the office action, Applicants respectfully submit that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,



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